chronic erosion sites, identify and characterize sand resources for restoration, and develop coastal management strategies to avoid future erosion hazards.

- Work with state legislators and county governments to define and assess budgetary needs.
- Develop cost/benefit procedures for guiding erosion management efforts.
- Conduct research into coastal processes, beach profile fluctuations, long-term changes, and GIS products for planners.

Although hardening the shoreline may temporarily protect property, it often results in beach loss on chronically eroding shores.

Resources

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Coastal Erosion and Beach Loss in Hawaii

Facts about beach erosion and the new Coastal Lands Program at DLNR

Beach loss at a hardened shoreline in Waimanalo, Oahu.

WHAT IS BEACH LOSS?

Nearly 25% (17 miles) of Oahu's beaches have been lost or significantly narrowed over this century. Greater losses are reported on the island of Maui. Any shore with a sandy beach is susceptible to beach loss from erosion.

These losses occurred where beaches were starved for sand in front of seawalls and other shoreline structures designed to protect buildings and coastal lands. Building walls is known as hardening the shoreline.

BEACH FACT Since 1964 the State of Florida Beach Erosion Control Program has restored 112 miles of critically eroding beach.

Seawalls, and sloping walls called revetments, stop erosion of coastal lands but they refocus the erosion onto the beach. This causes beach erosion and, eventually, beach loss.

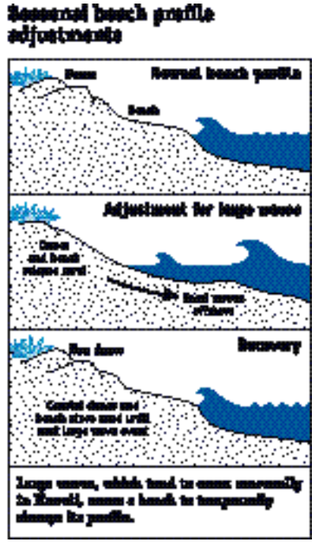
Beaches need sand

Healthy beaches have abundant sand. When sand supply is restricted, beaches will erode. Beach management, then, is actually “sand management.”

Beaches get sand from both the ocean and the land. Ocean currents can move sand along the coast to build beaches. Dunes and other landward sand deposits give sand to a beach in response to the forces of wind and waves.

High waves will cause a beach to change its shape (or profile). To absorb the additional wave energy, beaches and dunes give up sand to the waves which carry it seaward and drop it on the bottom. This raises the seafloor and flattens the overall profile of the beach. Waves then shoal and break further offshore, minimizing their erosive effects.

This typically happens in response to seasonal shifts in wave energy. Beaches recover from these natural changes when smaller waves move the sand back onto the beach and winds blow it into the dunes to be captured by coastal vegetation.



Coastal erosion and beach erosion are different

Coastal lands may experience long-term erosion under some conditions. For instance, if sea level is rising, the beach must eventually migrate landward or drown. This causes coastal land behind the beach to erode. Also, if the amount of sand from the seaward side is reduced, a beach will erode the land behind it to maintain a constant sand supply. This creates a condition called coastal erosion.

Beaches on eroding coasts still undergo seasonal profile adjustments, but they slowly shift their position landward as the land erodes.

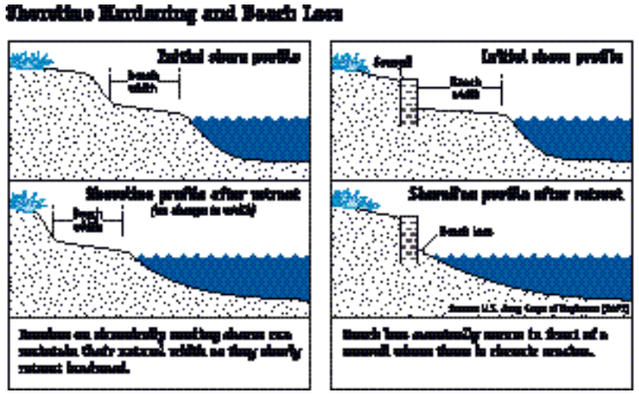
Hardening a shoreline can interfere with necessary profile adjustments because the dune can no longer share its sand with the beach. As a retreating beach encounters a seawall or revetment it can no longer draw upon a landward sand supply and it begins to erode.

Beach erosion leads to narrowing and, soon, beach loss. Much of Hawaii's beach loss could have been avoided if houses were not built so close to the water. The law presently allows homes 40 feet from the shoreline. On coasts experiencing chronic erosion this is too close and leads to hardening in order to protect houses from the waves.

BEACH FACT The University of Hawaii monitors over 80 beaches around the state to better understand the process of seasonal profile adjustment.

Beaches are threatened any time their supply of available sand is reduced. In addition to shoreline hardening, other processes contribute to erosion: sea-level rise, sand mining, channel dredging, dune grading, reef degradation, and others.

BEACH FACT Seawalls may stop coastal erosion, but on chronically eroding shores, hardening leads to beach erosion.



NEW COASTAL LANDS PROGRAM (CLP)

On November 20, 1997, the Board of Land and Natural Resources established the Coastal Lands Program (CLP) within the Land Division. The purpose of the CLP is to establish a strategic and comprehensive framework to protect and conserve the state's beaches. This framework is set out in the Coastal Erosion Management Plan (COEMAP), a joint effort of the Department of Land and Natural Resources (DLNR) and the University of Hawaii, Department of Geology and Geophysics.

BEACH FACT Florida spends over $8.5 million annually on erosion management.

Three major goals of the CLP

- Develop consensus on the causes and consequences of beach loss for the beaches of Hawaii.
- Develop agency agreements with respect to coordinating regulatory functions (i.e., permit streamlining and enforcement) and planning goals with other state, county, and federal agencies.
- Build support for legislative actions needed to implement COEMAP.

The ultimate goal of the CLP is to strike a balance between coastal development and beach conservation by promoting alternatives to shoreline hardening, such as beach and dune restoration, coastal lands acquisition, and strategic redevelopment.

The CLP will focus its energy on coastal lands where beaches are threatened because of land management issues associated with erosion.

The CLP will form linkages with federal agencies and community groups and provide funds for research and planning to support county land management efforts along the coast.

Reasons to Protect Hawaii's Beaches

- Sandy beaches are the backbone of Hawaii's multi-billion dollar visitor economy which provides the bulk of the state's jobs and income.
- Hawaiian beaches are tremendously popular around the world and are a leading tourist destination. The state's economic prosperity is directly linked to the quality of our beaches.
- Beaches are critical in flood and erosion prevention by serving as a natural buffer to prevent property damage from storm waves. As beaches narrow and disappear, shoreline properties become increasingly vulnerable to coastal hazards.
- Sandy beaches are a part of Hawaii's culture and heritage. All of Hawaii's beaches are public. They provide enjoyment, ocean access, relaxation, and spiritual fulfillment to Hawaii's people.
- Beaches and dunes are important elements of our shoreline environment and are critical to the health of the coastal marine ecosystem.

BEACH FACT At Miami Beach, every $1 invested annually to nourish the beach returns $700 annually in foreign exchange.

CLP Highlights

- Develop an enforcement strategy to address illegal shoreline structures. This would include compensation to the state, issuance of revocable easements, or removal.
- Pursue beach and dune restoration with sand nourishment. This can slow coastal erosion and restore lost beaches with both flood mitigation and recreational value. Restoration is a strategy that is successfully used on the mainland, but has not been employed widely in Hawaii.
- Conduct economic analysis to highlight the value of beaches to our society.
- Pursue acquisition of selected coastal lands.
- Work with the counties to review land use and development standards at erosion-prone areas.
- Conduct research to determine the causes of coastal erosion, map